# ARIZONA GAME AND FISH DEPARTMENT
# HABITAT PARTNERSHIP COMMITTEE
# HABITAT ENHANCEMENT AND WILDLIFE MANAGEMENT PROPOSAL

| Game Branch / HPC Project Number: | 14-518 |
|---|---|

## PROJECT INFORMATION

**Project Title**: Region 5 BHS Research Proposal for the Peloncillo and Silver Bell Populations

**Region and Game Management Unit**: 5, units 28 and 37A

**Local Habitat Partnership Committee (LHPC)**:
- Tucson and Safford

**Was the project presented to the LHPC?**
**YES**[X] **(Tucson)** **NO**[]

**Has this project been submitted in previous years? YES**[] **NO**[X]
**If Yes, was it funded? YES**[] **NO**[] → **Funded HPC Project #(s)**:

**Project Type**: Research to inform any future management decisions with regard to disease, genetics and metapopulation dynamics.

**Brief Project Summary**:
Translocations are a common tool for reestablishing historical populations that have been extirpated and for augmenting existing small populations. We currently lack disease exposure and genetic information from our populations to be able to make informed decisions about translocations. A science-informed decision-making process must guide these management efforts and having information about disease exposure and genetic diversity will be critical.

**Big Game Wildlife Species to Benefit**: bighorn sheep

**Implementation Schedule** (Month/Day/Year):

Project Start Date: September 1, 2014

Project End Date: June 30, 2018

**Environmental Compliance**:
NEPA Completed: Yes[] No[X] N/A[]
Projected Completion Date: To be determined

State Historic Preservation Office - Archaeological Clearance:
Yes[] No[X] N/A[]
Projected Completion Date: To be determined

Arizona Game and Fish Department EA Checklist: N/A[]
To be Completed by: Regional personnel
Projected Completion Date: Summer of 2015

## PROJECT FUNDING

| | |
|---|---|
| **Special Big Game License Tag Funds Requested**: | **$** 34,000 YR1<br>**$** 33,500 YR2 |
| **Cost Share or Matching Funds**: | **$** TBD |
| **Total Project Costs**: | **$ 67,500** |

## PARTICIPANT INFORMATION

| | | |
|---|---|---|
| **Applicant** (please print):<br>Region 5 WM's and Jim Heffelfinger | **Address**:<br>555 N. Greasewood Road<br>Tucson, AZ 85745 | **E-mail**:<br>jheffelfinger@azgfd.gov |
| **Telephone**: 520-628-5376 | | **Date**: September 1, 2014 |

**AGFD Contact and Phone No.** (If applicant is not AGFD personnel):

**Project has been coordinated with**:
Local members of the ADBSS.

**NEED STATEMENT – PROBLEM ANALYSIS:**
Bighorn populations in Arizona are actively managed in a number of ways largely due to their low intrinsic rate of increase which makes this species slow in recovering from population level reductions and in recolonizing areas formerly inhabited. Translocations are a common tool for reestablishing historical populations which have been extirpated and, for augmenting existing small populations for various reasons. However, with an increasing understanding of disease in wild sheep and the potential to inadvertently spread pathogens, it is important that all translocations consider the risks associated with introducing deadly agents into naïve populations. We currently have information about disease exposure for only a few populations in southeastern AZ from past research, sporadic hunter samples, and actual disease epizootics. Some populations are the result of translocations from elsewhere and some are indigenous and have never been augmented with other sheep. To reduce the risk of introducing disease that could dramatically reduce sheep populations, we must have a clear picture of what populations are exposed to what pathogens. Source locations for desert sheep are not plentiful now, but we need to lay the ground work now of having information in hand to be available as opportunities arise.

In addition to the need for disease exposure profiles in our herds to match appropriately with source herds, we also can benefit from learning more about the level of inbreeding in our herds. We can infer from the history of how translocated herds were founded that they have less genetic diversity than their parent herds. A statewide genetic analysis of sheep herds found the Silver Bell sheep population to have the highest inbreeding coefficient in the state and at levels considered high for any animal. There is no evidence of genetic inbreeding depression (reduced survival or reproduction) in this population, but knowing more about genetic diversity will allow us to make informed decisions about what management actions may be needed and provide a baseline level of genetic diversity for future comparisons.

Based on earlier genetic work, the Department plans to release 2 rams into the Silver Bell population in fall 2015 to help increase genetic diversity. The collar and capture costs for those 2 sheep will be covered under a separate translocation proposal.

**PROJECT OBJECTIVES:**
To gather the necessary information to be able to make informed management decisions in the future with regard to the bighorn population inhabiting the Peloncillo and Silver Bell ranges. Specific objectives include:

- Obtain disease exposure information to better assess potential risks to regional herds from domestic sheep or our management actions (primarily translocation). This will allow us to determine the most appropriate source population for any herd needing augmentation.
- Estimate several measures of genetic diversity to assess levels of inbreeding that could be exerting inbreeding depression on demographic population parameters.
- Assess movements and corridors to determine what subpopulations (or populations) are connected through sheep movements.
- Identify areas of sheep use to determine if sheep survey coverage is accurate and adequate
- Determine if camera traps can be used as a less expensive but reliable tool for estimating the number of bighorn in the population.
- Marked animals may assist in estimating observation rates for different habitat areas.

**PROJECT DESCRIPTION AND STRATEGIES:**

**Years 1 and 2**

Capture 10 ewes in each of the Peloncillos and Silver Bells and ear tag them. Also collect DNA sample, nasal and pharyngeal swabs, and blood samples. Repeat in year 2 for a total sample of 20 sheep in each population (approaching 1/3 of the population).

**Methods**

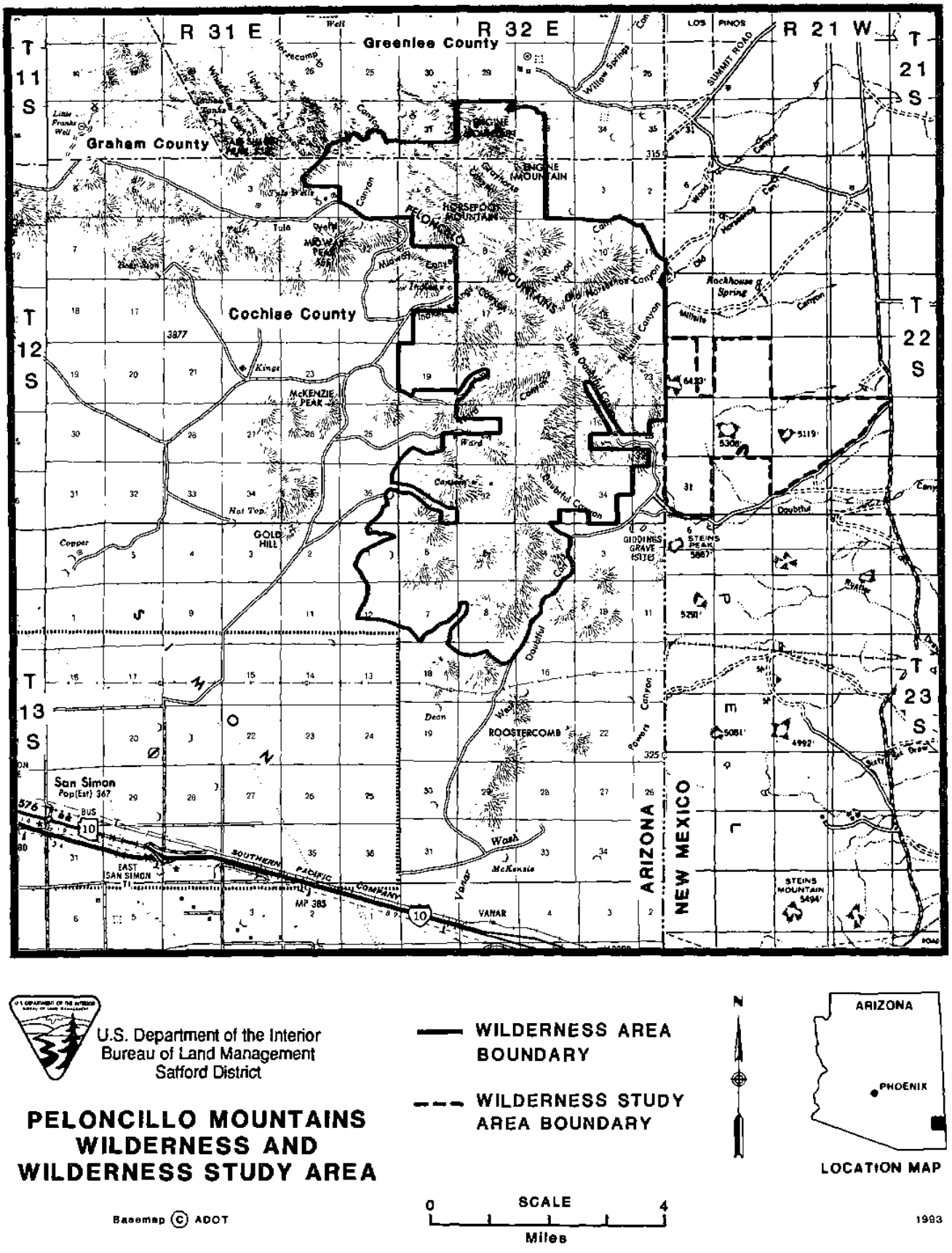
Bighorn would be captured with a helicopter and net gun as is standard procedure. Sheep will not have to be returned to a staging area. Animals can be processed at the site of the capture and released to reduce overall stress to the animal. While in hand, we will collect blood, swabs, and tissue samples and outfit with a collar or ear tags then release immediately.

Swabs and blood samples will be sent to the lab as soon as possible for analysis. Genetic samples will be archived until after the capture in year 2 and then submitted with subsamples of hunter harvested sheep tissue from the Department archives to maximize the sample size and power of the analysis. Because of the way genetic data are analyzed and visualized it would not be beneficial to run these after year 1 and again in year 2. The genetic information is not as urgently needed as is the disease.

Since we will have these animals in hand, they will all be tagged with a collar or ear tag. These marked animals will give us the opportunity to explore new innovative survey and monitoring methodology. We are already deeply involved with an extensive camera trapping effort and so we can explore the ways to use the marked animals as a mark-recapture calculation to estimate sheep abundance. This method involves looked at the percent of marked animals observed on cameras to estimate the percent of the population observed. We will be consulting with our Research Branch and others in the field to discuss this possibility (It is a secondary opportunity). This could be tested and compared to the helicopter surveys to see if it's a viable technique for gathering data during the non-survey years.

**PROJECT LOCATIONS:**
Peloncillo Mountains and Wilderness Area

**Map 1**




U.S. Department of the Interior
Bureau of Land Management
Safford District

**PELONCILLO MOUNTAINS WILDERNESS AND WILDERNESS STUDY AREA**

Basemap © ADOT

WILDERNESS AREA BOUNDARY

WILDERNESS STUDY AREA BOUNDARY

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LOCATION MAP

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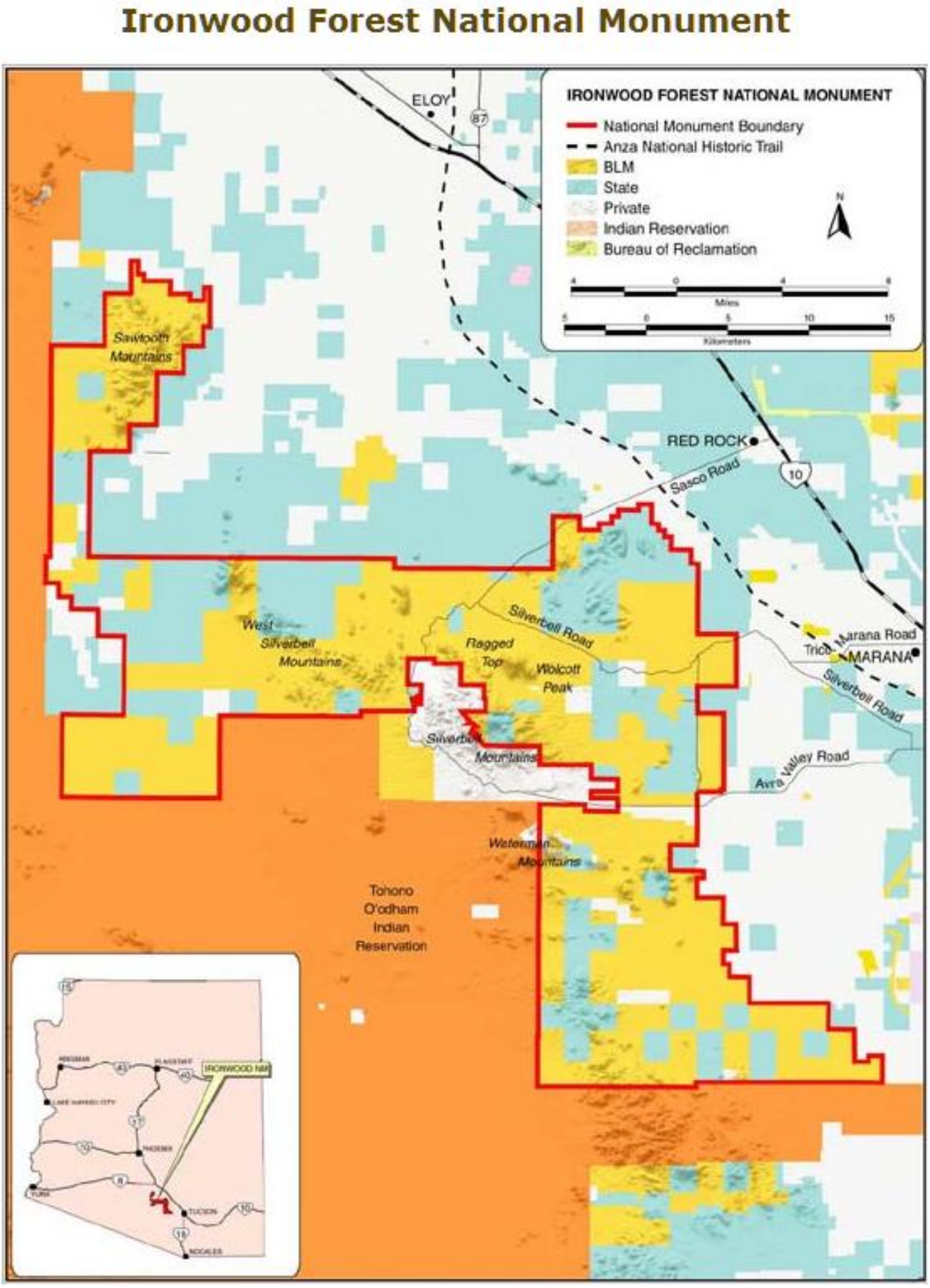
Silver Bell Mountains and the Ironwood Forest National Monument



**LAND OWNERSHIP AT THE PROJECT SITE(S)*:***
(if the project area is <u>private property,</u> please state specifically and provide the landowner's name)

A mixture of State Land Department lands, BLM lands, and private property (Silver Bells)

*IF PRIVATE PROPERTY, IS THERE A COOPERATIVE BIG GAME STEWARDSHIP or LANDOWNER AGREEMENT BETWEEN THE LANDOWNER AND THE DEPARTMENT?*
YES[] NO[] N/A[]

An agreement may be developed with Asarco to be able to conduct bighorn management actions on mine properties within the Silver Bells.

**HABITAT DESCRIPTION:**

**<u>Peloncillo Mountains</u>**

The Peloncillo Mountains of Cochise County are a 35 mi (56 km) long range. The north section is oriented north-south, and is bordered on the north by the Gila River which flows west-northwesterly from western New Mexico. The Whitlock Valley and Whitlock Mountains border to the west.

The southern section of the range is a northwest by southeast region, and contains the Peloncillo Mountains Wilderness. The highest point of the range is Midway Peak, 5,551 ft (1,692 m). Midway Peak is just west of the northern part of the wilderness.

Other peaks in the southern region of the Peloncillo Mountains from north to south are, Mount Rayburne, 4,680 ft (1,426 m), Winchester Peak, 5,127 ft (1,563 m), San Simon Peak, 5,325 ft (1,623 m), Engine Mountain, Gold Hill, and Roostercomb.

The 19,440-acre Peloncillo Mountains Wilderness is located 9 miles northeast of San Simon, Arizona, in Graham, Greenlee and Cochise counties. The wilderness lies within the rugged Peloncillo Range, which stretches from Mexico to the Gila River.

Terrain is very rocky with rugged mountains. Elevation ranges from 3,000' to 7,000'; vegetation ranges from riparian cottonwood-willow and salt cedar along the Gila River, to Chihuahuan Desert in the lower elevations and oak woodland and/or pinyon-juniper at the higher elevations (Gila Mountains and Mule Creek Pass).

**<u>Silver Bell Mountains</u>**

The Silver Bell Mountains are an arid north-northwest by southeast trending small mountain range in north-central Pima County, Arizona. The range lies 14 miles (23 km) west of Marana, Arizona, northwest of Tucson. Elevations here range from 1,800 to more than 4,200 feet.

The range is located in the east portion of the Ironwood Forest National Monument, and is located in a group of four mountain ranges. Ragged Top, located in the north of the range. The range is named for the Silver Bell Mine located at the southern end of the mountains. The range abuts the Waterman Mountains to the southeast.

The West Silver Bell Mountains are a small, low elevation range, in eastern regions of Arizona's Sonoran Desert. Lower elevation regions west or southwest are even more arid, as the Sonoran Desert gets closer to northwest Mexico's Gran Desierto de Altar. The high point of the range is Solo Peak, 2,749 feet (838 m). The West Silver Bell Mountains are northwest-southeast trending, and merge in the southeast with a mostly north-south Silver Bell Mountains.

The West & Silver Bell Mountains both lie in the northeast of the Aguirre Valley, a 35-mile-long, northwest-by-southeast trending valley bordered by five regional, low-elevation mountain ranges; the valley is Basin and Range oriented, and the north merges into the floodplain region near the confluence of the northwest-flowing section of the Santa Cruz River (Arizona) with the Gila River. The community of Saguaro, Arizona lies at the southeast end foothills of the West Silver Bell Mountains, and is also bordered east by the main Silver Bell range foothills.

Ironwood Forest National Monument is located in the Sonoran Desert of Arizona. Created by Bill Clinton by Presidential Proclamation 7320 on June 9, 2000, the monument is managed by the Bureau of Land Management, an agency within the United States Department of the Interior. The monument covers 188,619 acres (76,331 ha), of which 59,922 acres (24,250 ha) are non-federal and include private land holdings and Arizona State School Trust lands.

A significant concentration of Ironwood (also known as Desert Ironwood, *Olneya tesota*) trees is found in the monument, along with two federally recognized endangered animal and plant species. More than 200 Hohokam and Paleo-Indian archaeological sites have been identified in the monument, dated between 600 and 1450.

**ITEMIZED USE OF FUNDS:**

| **Silver Bell and Peloncillo BHS Project Costs** | | |
|---|---|---|
| **Description of Cost or Activity** | **Year 1** | **Year 2** |
| Capture Costs | $25,000 | $25,000 |
| Disease and Genetic Sampling<br>20 samples (Yr1) and 20 (Yr 2) x $400 ea | $8,000 | $8,000 |
| Misc Equipment (ear tags, swabs, vials, razor blades, tools, tape, etc.) | $1,000 | $500 |
| Total | $34,000 | $33,500 |

Special Big Game License Tag Funds
$67,500 for the 2-year project

Cost Share or Matching Funds (*for volunteer labor rates please refer to the worksheet below*)
To be determined

**LIST COOPERATORS AND DESCRIBE POTENTIAL PARTICIPATION:**
Arizona Desert Bighorn Sheep Society – volunteers, support and funding.
BLM – Safford – NEPA coordination
BLM Tucson – NEPA coordination
Asarco – Silverbell mine – access to conduct management operations

**WOULD IMPLEMENTATION OF THIS PROJECT ASSIST IN PROVIDING, MAINTAINING, OR FACILITATING RECREATIONAL ACCESS?**
YES[] NO[] N/A[X]

**PROJECT MONITORING PLAN:**
To be determined by regional personnel and largely addressed above.

**PROJECT MAINTENANCE:**
To be determined by regional personnel.

**PROJECT COMPLETION REPORT TO BE FILED BY:**
Regional personnel.

**WATER DEVELOPMENT PROJECTS (***please use the worksheet below***):**

**TREE CLEARING/REMOVAL PROJECTS (***please use the worksheet below***):**